

NOBLE (C.P.)

Procidentia Uteri.¹

BY CHARLES P. NOBLE, M.D.,

Surgeon-in-chief of the Kensington Hospital for Women, Philadelphia.

THE condition of procidentia uteri is of importance to the practitioner because of the frequency with which it exists, and because of its curability when properly treated. Without proper treatment it becomes progressively worse, until finally, in some cases, such changes ensue in the posterior vaginal wall and pelvic floor that its curability is questionable. In order to appreciate the treatment of procidentia it is necessary to refer to the factors engaged in maintaining the pelvic organs in their normal relations, and also to the causes which tend to produce their downward displacement, and especially to the displacement of the uterus. The tendency is strong to consider the uterus separate and apart from the other pelvic organs, especially in relation to the causes of its displacement. This tendency is unphilosophical, and results in confusion and in erroneous inferences. In general, the same factors preserve all of the pelvic organs in their normal relations, and the same factors are at work in the displacement of each and all of these viscera. The influence of atmospheric pressure in maintaining the pelvic viscera in their normal relations is frequently overlooked. The peritoneal cavity is a shut sac immediately in relation with the thoracic cavity, being separated therefrom by the diaphragm. As under normal conditions the urethra,

vagina, and rectum are closed canals, impervious to air, it follows that atmospheric pressure has a very positive effect in maintaining the pelvic viscera at a certain level. This level is fairly constant, as the capacity of the thorax (which has a free communication with the external air) is fairly constant. This influence of atmospheric pressure has been treated of by writers, especially by Thomas, under the heading of "The Retentive Power of the Abdomen." Atmospheric pressure is the constant factor giving the abdomen retentive power. Variations in the tonicity of the abdominal muscles interfere with this function; and when the abdominal walls become very lax from over-distention, or from atrophic changes, this factor in maintaining the normal status of the pelvic viscera becomes largely inoperative.

Habits of dress also modify the influence of the intra-abdominal pressure in maintaining the pelvic viscera in position. The use of tight corsets, by restricting the excursions of the diaphragm, tends to prevent the ascent of the pelvic viscera which takes place normally with each expiration. Also, by displacing the abdominal viscera downward and forcing the bowels down upon the pelvic organs, tight lacing acts by driving downward the pelvic contents. Tight lacing kept up for a long period of time, acts further by inducing an atonic condition of the muscles of the trunk,

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thereby interfering with the normal intra-abdominal pressure, and with the so-called retentive power of the abdomen.

Another factor which is not much dwelt upon is the adipose tissue which is present in the pelvis. When a woman becomes rather suddenly and markedly emaciated, the loss of adipose tissue in the pelvis favors the displacement of the pelvic viscera. During and after the time of the menopause, when the fatty tissues about the genitalia very generally undergo absorption, displacement of the pelvic viscera often occurs. Prior to this time, in many cases, although various injuries which favor displacement may have been sustained, yet, owing to the presence of the fatty tissue, displacement does not result. In these cases, after the atrophy of the fatty tissues occurs, prolapse of the pelvic viscera takes place.

Other factors, not directly connected with the pelvic structures themselves, which must be considered, are certain habits of patients. Too laborious work favors displacement of the pelvic organs, especially when their proper supports are for any reason weakened. As a rule, those who are called upon to do laborious work have vigorous muscular systems, and with intact pelvic organs no harmful consequences ensue. Such consequences are most apt to ensue when a feeble woman is called upon to do extremely heavy work, or when such work is performed by one who has suffered injury to the pelvic supports.

Constipation favors prolapse of the pelvic viscera for very much the same reason as does too laborious work—the straining at stool accomplishing the same result as the too laborious

work. Constipation acts also by favoring pelvic congestion, which, no matter how induced, always favors displacement of the viscera by inducing laxity of the tissues.

These general considerations are of importance, not only as permitting the proper appreciation of the causes which underlie displacement of the pelvic viscera, but also for the very great assistance in the curative treatment of these disorders which a proper appreciation of the above facts affords.

More important, however, than the foregoing are the proper supports of the pelvic organs themselves. In women, as in men, the entire pelvic contents are supported by the action of the levator ani muscles, the pelvic fasciæ, the sacro-sciatic ligaments, and the pelvic connective tissues. It is true that the peritoneum and the connective tissue which lies under it affords some additional support from above. The bladder, the womb and its appendages, the vagina and the rectum, and the super-imposed, small intestines are all supported by the structures referred to. They make up the pelvic floor, and upon their integrity the normal position of the pelvic viscera depends. The connective tissue of the peritoneum about the bladder and also about the rectum and the other organs has a minor influence in fixing within certain limits these organs. The uterus, more especially, receives other support than that of the pelvic floor,—the utero-sacral, the broad, and the round ligaments affording a certain amount of support to this organ. The careful study of the whole subject, however, is convincing that these ligaments and the retentive power of the abdomen, brought about by the atmos-

pheric pressure, are of importance, rather as maintaining the uterus in its normal position of anteflexion than in keeping it at a certain plane in the pelvis. Undoubtedly, these factors have a certain influence in preventing downward displacement of the uterus, but all combined they are not of so much importance as is the normal pelvic floor.

The principal support which maintains the pelvic viscera in their normal relations is the pelvic floor, the most important structures in which are the levator ani muscles and the pelvic fasciae. Upon the integrity of these structures the support of the pelvic viscera depends. When these structures no longer perform their normal functions, either because of atrophy or because of laceration of their tissues, downward displacement of the pelvic viscera is favored. This point cannot be too strongly insisted upon; nor can it be made too clear that these are the structures of importance in giving support to the rectum, vagina, bladder, and uterus, rather than an imaginary structure formerly known as the perineal body.

The old theory that the perineal body was the prime factor in pelvic support must be definitely abandoned, because it is based in error. There is no such structure as the perineal body. The tissues between the lower end of the vagina and the rectum are certain slips of the levator ani muscles, the transversus perinei muscles, the deep and superficial fasciae, connective tissue, blood-vessels and nerves, and the bulbo-cavernosus muscle. The ends of these slips of muscle unite in the median line, forming a somewhat tendinous union. The amount of tissue between the rectum and vagina

is very much overestimated. Any one can demonstrate that this septum is scarcely more than a third of an inch in thickness if he will examine a nulliparous woman, placing the thumb in the vagina and the forefinger in the rectum. Such an examination will dispel from his mind any idea which he may have had that there is a large wedge-shaped mass of tissue situated between these two canals, which, in virtue of its size and shape, holds up the pelvic organs.

Women having the greatest amount of tissue between the anus and posterior commissure of the vulva, have really the least support for their pelvic organs. This fact, so directly at variance with the ancient teaching upon this subject, is easily explained. When the levator ani muscle, or a part of it, has been torn through, the pelvic floor drops down, and if the skin over the perineum has not been ruptured it stretches out. The anus drops down toward the feet and back toward the coccyx, so that the skin between the anus and the vulva is put upon the stretch. These facts are easily capable of demonstration, and any one who doubts them can easily satisfy himself of their correctness. They show also that visual inspection of the perineal region is insufficient to test its integrity. Cases which have appeared to receive no injury may have severe lacerations within the vulva; and other cases which appear to have been badly torn because of the involvement of the skin over the perineum may, in reality, have escaped without injury to the deeper and important structures of the pelvic floor. The examination, to be complete, must include palpation of the levator muscles to test their powers

of resistance when drawn upon by the palpating fingers.

The physiology of the support of the pelvic viscera appears to be as follows: The rectum and vagina receive direct support from the levator muscles. Their orifices are kept closed partly by the action of these muscles, and partly by the sphincter ani and bulbo-cavernosus muscles. The anterior wall of the vagina and the bladder are supported upon the posterior wall of the vagina; and the uterus and its appendages are supported upon these structures. The connective-tissue attachments of the organs named, of course, are of service in limiting their mobility; and, in addition, the proper supports of the uterus are of much importance.

When all of the factors concerned in maintaining the pelvic organs in their proper relations are normal, these organs are retained in their proper positions. Their downward displacement is due either to increased pressure from above, or to diminished support from below, or to both. The influence of heavy lifting, of tight lacing, of constipation, and of emaciation, in favoring displacement, have been considered. Two other causes remain: one is retro-displacement of the uterus, and the other is increase in the size and weight of the uterus. The influence of the second cause in favoring downward displacement is so clear that it is unnecessary to enlarge upon it. The influence of retro-displacement in favoring descent of the uterus is equally clear, if the anatomical and physical relations of the pelvic viscera are remembered. The uterus, in its normal position of ante-flexion, lies with its axis at an acute angle with

the vagina; indeed, when the bladder is empty, the fundus of the uterus approaches very close to the anterior wall of the vagina. In this position, when the uterus is forced downward, it simply tends to push the anterior wall of the vagina against the posterior wall, when it meets with the resistance of the pelvic floor; hence the vagina is not distended. In this position the force of the intra-abdominal pressure falls upon the posterior wall of the uterus, and maintains the uterus in its normal anti-flexed position. If, for any reason, the uterus becomes retro-displaced, its axis becomes parallel, or almost parallel, with the axis of the vagina. Intra-abdominal pressure falls upon the fundus and anterior wall of the uterus and the vesico-uterine pouch, and tends not to drive the cervix and the anterior vaginal wall against the posterior vaginal wall, but to drive the whole uterus downward along the axis of the vagina; thus to a greater or less degree, inverting the vagina in its descent. In this mal-position of the uterus, intra-abdominal pressure, instead of being a conservative force tending to maintain the uterus at a certain level, becomes a factor of evil tending to produce procidentia uteri and prolapse of the bladder. The degree to which these displacements are carried depends, of course, upon the amount of intra-abdominal pressure, upon the laxity of the tissues in an individual case, and upon the amount of resistance met with from the pelvic floor. So much for the causes acting from above.

When the pelvic floor becomes weakened, either by laceration or atrophy of its structures, adequate support to the pelvic viscera is no

longer afforded. The pelvic floor drops downward and backward, the introitus vaginalis gapes open, the posterior wall of the vagina drops away from the anterior wall, the rectum tends to bulge forward through the gaping vulva, constituting a rectocele; the anterior wall of the vagina and the bladder tend to prolapse into the introitus, constituting a cystocele; and in turn the uterus tends to come down (partly from lack of support, and partly through the influence of pressure from above), constituting a prolapsus or procidentia uteri.

The proper study of every case of procidentia involves a careful investigation into each of these factors which may be concerned in its production, and upon the proper recognition of exactly what underlies each case depends the scientific and curative treatment of the disorder.

In my experience, by far the most important cause of procidentia is laceration of the pelvic floor, especially lacerations involving the levator ani muscle and pelvic fascia. This injury is the primary cause of procidentia in ninety-nine per cent. of the cases which come under my observation. I see numerous cases of slight prolapsus or descensus uteri, where the uterus simply descends one inch, or an inch and a half, which are due to other causes than a torn pelvic floor. Such causes as tight lacing, hard work, constipation, pelvic congestion, etc., can bring this about. But in my experience these causes, broadly speaking, are incapable of producing complete procidentia of the uterus. There are exceptions to this rule, but only one has come under my observation. This was a case of complete procidentia in a nulliparous woman

having lax tissues, who had been compelled to do laborious work with heavy lifting. Her uterus doubtless had become retroverted, then prolapsed, and, finally, had been forced down so low that it protruded between the labia. This woman had a lax, but intact pelvic floor. She was cured by changing her occupation, the use of tampons for a time, followed by a Smith-Hodge pessary.

Treatment.—As the primary cause of procidentia is a torn pelvic floor, it follows that if lacerations of the pelvic floor were properly repaired at the time of their occurrence, or shortly thereafter, that procidentia uteri would be prevented. In other words, the way to prevent procidentia uteri is to do immediate perineorrhaphy in all cases of laceration of the pelvic floor following labor. It is unnecessary at this time to go into the details concerning the technique of immediate perineorrhaphy. I shall simply say, that in this operation the sutures should be placed just as carefully, and in the same manner, as for the secondary operation. The patient should be anaesthetized, the parts well exposed, and the suturing begun at the upper angle of the tear, no matter how high up this may be. The sutures should be tied as they are introduced, so that when the last suture is introduced and tied the operation is completed. Immediate perineorrhaphy can be done at any time within twenty-four hours after labor, and doubtless even later, with complete success. If, however, the suturing is postponed more than six hours after the injury has occurred, it is better to freshen the raw surfaces by scraping them with a knife. These lacerations will be found, almost invariably, to

extend up one or both sulci of the vagina. They are never median, unless the tear extends through the sphincter ani, and then splits the recto-vaginal septum. It is far better to postpone immediate perineorrhaphy for six, ten, or twenty-four hours, and to have proper assistance, than it is to attempt the operation at the close of labor, when the physician is tired out, the patient exhausted, and, perhaps, without anaesthesia, because no one is present to administer the anaesthetic. The practice somewhat in vogue of putting in one, two, or three sutures from the skin perineum cannot be too strongly condemned; because all severe lacerations extend one, two or three inches up one or both sulci of the vagina, and cannot be reached by sutures introduced from the skin perineum. All that such suturing can accomplish is to unite the unimportant superficial structures of the skin perineum, while the torn levator muscles are not included in the sutures.

The other factors which produce procidentia are those which increase intra-abdominal pressure (such as tight lacing and laborious work), retro-displacement of the uterus (which favors procidentia, because in this position intra-abdominal pressure tends to drive the uterus along the vagina, and parallel with its axis), pelvic congestion, brought about especially by constipation, sub-involution of the uterus and other pelvic organs, and in rare cases the presence of a tumor adds to the weight of the uterus. A perfect prophylaxis of procidentia uteri involves the prevention or cure of all of these conditions.

When procidentia really exists cer-

tain conditions are always present. The uterus prolapses into or through the vulva, and its proper ligaments are overstretched. The anterior vaginal wall and bladder are prolapsed, and in many cases a large cystocele is present. The posterior vaginal wall and rectum have dropped downward and backward with the pelvic floor; and the rectum may, or may not, have bulged through the open introitus, if so, constituting a rectocele. In many cases the uterus will be found elongated, constituting the condition known as supra vaginal elongation of the cervix. This is brought about by stretching of the cervical tissue, rather than by its hypertrophy. In such cases the fundus uteri occupies a higher plane in the pelvis than would appear from the position of the cervix. In many such cases the uterus measures four, five or even more inches; and yet often reducing the procidentia and putting the woman in the knee-chest posture, it will be found to measure only three or four inches.

The method of operating which I have followed in treating this class of cases is to do a high amputation of the cervix, anterior colporrhaphy, and Emmet's perineorrhaphy. The amputation of the cervix reduces the size and length of the uterus, and through the way it is done draws the vagina to a higher point in the pelvis. The anterior colporrhaphy takes up the slack under the bladder and makes the anterior vaginal wall a straight line from the pubic arch to the cervix, as it should be. The perineorrhaphy restores the pelvic floor to its normal condition, and gives permanent support to the bladder and uterus. Naturally the uterus should be main-

tained in ante-flexion, and if after an operation it does not assume this position, a Smith-Hodge pessary is introduced to maintain the uterus in its normal position. Practically, I have seldom found this necessary even for a short time, and of the very many operations which I have done for procidentia, so far as I know, not a single woman is now wearing a pessary.

In amputating the cervix, the woman is placed in the lithotomy posture; the field of operation made aseptic; the cervix is seized with bullet forceps and drawn down; the vagina is cut loose from the cervix; the bladder is stripped off in front, and the sub-peritoneal tissues stripped off behind. The lateral attachments of the cervix (the bases of the broad ligaments) are now ligated and cut away. About an inch of the cervix is now amputated; then the cut edges of the vagina are stitched to the stump of the cervix, the mucous membrane of the vagina to the mucous membrane of the cervical canal; thus covering in the stump, and securing primary union. This operation draws up the vagina to the cervix at its new level. Also, it very materially reduces the size and weight of the uterus, not only through removing part of the structure, but by the process of involution which it induces.

Anterior colporrhaphy is next performed. In those cases in which the bladder has not been markedly prolapsed a simple oval denudation is made, which is closed with a continuous catgut suture in two layers. In marked cases of cystocele Stoltz's operation is done. This consists of a circular denudation, with a single

running suture placed like the drawing-string of a bag, and tied in the same way. The operation is quickly done, and secures a firm point of cicatricial union under the bladder. I believe that the merit of the operation consists not only in the ease and rapidity with which it is done, but also that it offers a more permanent resistance to the descent of the bladder at a future time.

Emmett's perineorrhaphy is then done, and is that part of the operation which makes the cure a permanent one. The operations upon the cervix and upon the bladder would for a time overcome the prolapse of these structures, but when the woman got about on her feet again, the prolapse would simply reappear were not the primary cause of the trouble (namely, the lacerated pelvic floor) repaired. In restoring the pelvic floor I have not been content with doing the regular Emmett's perineorrhaphy, but taking this operation as a basis, I have made the denudation as extensive as possible; in this way not only bringing together the sundered structures, but in addition making the vagina as narrow as possible, and also sewing up the vulva to a certain extent. In this way the vagina can be reduced in size, so that it scarcely admits more than the index finger,—an end to be desired in every bad case of procidentia.

In doing amputation of the cervix, a few heavy silk ligatures are used, but most of the operation is done with catgut. It is well to have a silk ligature to pass through each lip of the cervix into the cervical canal, so as to have two silk ligatures at the point where the future os uteri is to be, as otherwise the raw edges of the cut

vagina might unite, which would necessitate making an external os at a later day. The bases of the broad ligaments can be tied off with catgut, and almost all of the sutures about the cervix can be of this material. This is a decided advantage, as it is not desirable to make traction upon the perineum to remove these sutures for some weeks after the operation. In doing the colporrhaphy, when the oval denudation is made, the wound is closed usually with a running catgut suture placed in two tiers. Usually one or more silk sutures are introduced to act as stays. In operating upon the pelvic floor, the upper sutures are of catgut and the lower ones of silk. This obviates the necessity of removing the upper sutures, which embrace only the cut vaginal walls, and which are used only to help in narrowing the vagina. Silk is used in suturing the torn ends of the muscles and for the external sutures. The ones in the skin are removed in a week, those in the vagina after two weeks.

It is wise to treat patients having procidentia for some weeks prior to their operation. The uterus should be reposed and kept in its position by means of tampons. In order to secure this object it is at times necessary to put the woman to bed. In very bad and long-standing cases of procidentia, the mucous membrane of the vagina loses its proper character, and becomes very much like skin. It is of decided advantage to reduce the procidentia and to treat the condition with glycerin tampons, which helps to restore the parts to a more nearly

normal condition. After the operation it is best to keep the patient in bed for at least two weeks, and preferably for three weeks, and then to permit only a very gradual resumption of her ordinary occupation. Such patients should be cautioned against straining or lifting, and should be informed that it requires some weeks for a wound to become thoroughly consolidated.

It is, perhaps, wise, in this connection, to say a few words about the use of the pessary for procidentia. Excepting those rare cases in which the procidentia has occurred in spite of the fact that the pelvic floor is intact, the use of the pessary for this condition is clearly illogical. A pessary can never restore a torn pelvic floor; and if this accident has been the cause of the procidentia, any treatment except the repairing of the injury is clearly illogical, and can be only of temporary value. The pessary is a useful instrument in the treatment of slight descensus and of retroflexion of the uterus when the pelvic floor is intact. The pessary should be supported from below, partly by the vagina itself and largely by the encircling slips of the levator muscle. It should never get its support from the pelvic bones, which is what happens when a large pessary is introduced to hold up a procidentia when the pelvic floor is widely torn. Used under these circumstances, a pessary must be large in order to be retained, and when it is large it invariably presses against the pubic bones. It is only necessary to point out how illogical this use of the pessary is in order that its application may be condemned.